

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

**RECEIVED**  
**SEP 14 1998**  
FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

In re Applications of	) MM Docket No. 86-441
	)
ACHERNAR BROADCASTING COMPANY	) File No. BPCT-860410KP
and	)
LINDSAY TELEVISION, INC.	) File No. BPCT-860410KQ
	)
For Construction Permit for a new Television	)
Station, Charlottesville, Virginia	)

**MOTION FOR LEAVE TO FILE RESPONSE**

The Association of Public-Safety Communications Officials-International, Inc. ("APCO") hereby see leave to file a response to the Consolidated Reply of Achernar Broadcasting Company and Lindsay Television, Inc. ("Applicants") to the Mass Media Bureau's Opposition to their proposal for television channel 19 in Charlottesville, Virginia.

APCO is the nation's oldest and largest public safety communications organization. Most of its 13,000 individual members are state or local government officials involved in the management, design, and operation of police, fire, emergency medical, local government, highway maintenance, forestry conservation, disaster relief, and other public safety communications systems. APCO is certified by the Commission under Part 90 as a frequency coordinator for public safety radio channels, including land mobile radio frequencies in the 470-512 MHz band, and frequency appears before the Commission to represent the interests of public safety agencies throughout the nation..

APCO has not been a party to this proceeding. However, the Applicants are now seeking to operate a television station on frequencies immediate adjacent to frequencies

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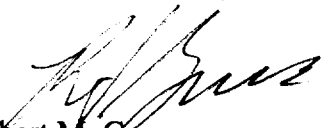
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allocated for public safety and other land mobile radio operations in the Washington, D.C., metropolitan area. Furthermore, Applicants to continue seek use of a television channel has been reallocated on a nationwide basis for public safety use. Therefore, APCO now has an interest in this proceeding and requests leave to file the attached pleading.

Respectfully submitted,

ASSOCIATION OF PUBLIC-SAFETY  
COMMUNICATIONS OFFICIALS-  
INTERNATIONAL, INC.

By:

  
Robert M. Gurss  
WILKES, ARTIS, HEDRICK & LANE,  
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September 14, 1998

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**RESPONSE OF APCO  
TO CONSOLIDATED REPLY TO OPPOSITIONS**

The Association of Public-Safety Communications Officials-International, Inc. ("APCO") hereby submits the following Response to the proposal of Achernar Broadcasting Company and Lindsay Television, Inc. ("Applicants") to amend their applications to request assignment of channel 19 as a new television station in Charlottesville, Virginia.

APCO is the nation's oldest and largest public safety communications organization. Most of its 13,000 individual members are state or local government officials involved in the management, design, and operation of police, fire, emergency medical, local government, highway maintenance, forestry conservation, disaster relief, and other public safety communications systems. APCO is certified by the Commission under Part 90 as a frequency coordinator for public safety radio channels, including land mobile radio frequencies in the 470-512 MHz band.

The Applicants originally sought a license to operate on channel 64, in Charlottesville. However, pursuant to the Balanced Budget Act of 1997, the Commission has reallocated channels 63, 64, 68, and 69, for public safety radio services, and has dismissed all pending applications for television stations on those channels.<sup>1</sup> The Commission did provide an opportunity for applicants to amend their applications to proposed alternative channel assignments. In response, the Applicants have proposed channel 19. However, as explained by the Mass Media Bureau in its Opposition, channel 19 cannot be assigned in Charlottesville due to adjacent channel interference to land mobile operations on channel 18 in the Washington, D.C., metropolitan area, including many public safety communications systems.

Portions of the 470-512 MHz band (TV channels 14-20) have long been available for land mobile sharing in certain metropolitan areas. *See* 47 C.F.R. §90.301, *et seq.* In Washington, D.C., channels 17 and 18 (488-500 MHz) are set aside for land mobile use. Some of the current public safety land mobile licensees in the 488-500 MHz band include the District of Columbia, the State of Maryland, Montgomery County, Prince George's County, Anne Arundel County, the City of Fairfax, and the City of Alexandria.<sup>2</sup> Pursuant to Section 90.305, land mobile base station transmitters can be located anywhere within 50 miles of the geographic center of Washington, D.C., and mobile units may be used

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<sup>1</sup> Report and Order in ET Docket 97-157, Reallocation of Television Channels 60-69, the 746-806 MHz Band, FCC 97-421 (released January 6, 1998), 63 Fed. Reg. 6669 (February 10, 1998). The Applicants have filed a Petition for Reconsideration of that action, to which APCO has filed an Opposition. The Applicants' use of channel 64 would bar public safety use of that channel (and potentially paired frequencies at channel 69), throughout much of the State of Virginia and surrounding areas.

<sup>2</sup> Due to "spectrum refarming" (i.e., the "splitting" of current 25 kHz channels into 12.5 kHz channels), there is a potential for additional land mobile assignments in the Washington area.

within 30 miles of their associated base stations. Thus, mobile units on the subject frequencies could be used as far as 80 miles from the center of Washington, D.C.

The Commission has stated that it will observe a 140 mile separation for television/land mobile adjacent channel allotments in TV channels 14-20. See Mass Media Bureau Opposition. The Applicants' proposed site is less than 102 miles from the geographic center of Washington, and just 52 miles from the 50 mile radius of Washington in which land mobile base stations can be located. Mobile radios operating from a land mobile base station at the edge of the 50 mile radius could be within as little as 22 miles from the Charlottesville proposed television station.

However, this is more than just a matter of mileage separations. The relatively close proximity between the proposed TV transmitter site and land mobile base stations operating at the edge of the Washington DC service area will result in harmful interference to base stations receivers tuned to frequencies in the 494-500 MHz range (UHF-TV channel 18). As proposed, the TV transmitter would place its 64 dBu Grade B contour within 2 miles of the 50 mile radius defining the Washington, D.C. land mobile service area. Calculations show that a one megawatt TV transmitter operating at the proposed Charlottesville site would need to attenuate nearby out-of-band emissions by approximately 80 dB to ensure that it causes less than 1 dB of degradation to a land mobile base station located more than 50 miles away and operating at 499.9875 MHz. (See attached Engineering Statement of David Eierman). This level of attenuation would be extremely difficult to achieve particularly to protect frequencies only 1.25 MHz removed from the main picture carrier.

It will also be difficult, if not impossible, to maintain a 0 dB D/U ratio for television reception within the Grade B contour due to adjacent channel land mobile interferors. Because the proposed Grade B contour nearly touches the outer boundary of the land mobile service area, mobile units associated with outlying land mobile stations can legitimately operate well within the Grade B contour and interfere with television reception. This fact is recognized, but minimized, by the applicant's consultants, mainly because only two existing land mobile systems now place a 39 dBu service contour within the proposed Grade B contour. Even assuming that this characterization of the existing environment may be accurate, the FCC should not take any action that would restrict land mobile operations at any location within the 50 mile service area.

APCO also objects to the Applicants' suggestion that they can use channel 64 in Charlottesville, notwithstanding the reallocation of that channel for public safety. Applicants claim in support of their suggestion that public safety does not need additional spectrum in Virginia. First, Applicants' petition for reconsideration in ET Docket 97-157, not this proceeding, is the proper forum to address the required dismissal of their applications for channel 64. Second, the public safety spectrum requirements which provide the basis for the reallocation of channels 63, 64, 68, and 69, were examined in the voluminous 1996 Report of the Public Safety Wireless Advisory Committee (PSWAC), which concluded that additional spectrum was needed immediately on a nationwide basis. Third, Congress required the Commission to allocate 24 MHz nationwide to public safety, and rejected proposals that would have permitted the Commission to allocate less than 24

MHz in certain areas.<sup>3</sup> Fourth, Applicants' Charlottesville co-channel operation on channel 64 are likely to prevent public safety operations not only in rural southwestern Virginia, but also in portions of the Washington, D.C. metropolitan area (and, presumably, in Richmond which is just 74 miles from Charlottesville). Fifth, any state-wide public safety network in Virginia would be blocked by the use of channel 64 in Charlottesville. Finally, the 30 MHz paired channel separation adopted in WT Docket 97-157, would mean that the Applicants' use of channel 64 (770-776 MHz) would also prevent use of the pair frequencies on channel 69 (800-806 MHz).

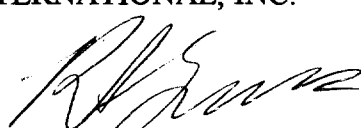
#### CONCLUSION

For the reasons discussed above, APCO opposes the Applicants' proposal for channel 19, and their continued efforts to undo the Commission's dismissal of their channel 64 proposal.

Respectfully submitted,

ASSOCIATION OF PUBLIC-SAFETY  
COMMUNICATIONS OFFICIALS-  
INTERNATIONAL, INC.

By:

  
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September 14, 1998

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<sup>3</sup> See House Report No. 105-149, H.R. 2015, Section 3033, describing the initial version of the bill which provided that the FCC shall allocate 24 MHz for public safety services "unless the Commission determines that the needs for public safety services can be met in particular areas with allocations of less than 24 MHz." The final version of H.R. 2015, as reported in House Report 105-217 (see p. 578-579), eliminated that proviso.

## Engineering Statement of David Eierman

I, David Eierman, state under penalty of perjury that the following is true and correct:

1. I am a radio systems engineer well experienced in the design and deployment of land mobile radio systems. I have been an employee of Motorola for 22 years and my current position is Senior Staff Engineer in the Spectrum Resources Group.
2. Working for Motorola, I have devoted extensive time to the National Public Safety Telecommunications Council and standardization work in the Telecommunications Industries Association leaving me well acquainted with the particular needs of public safety systems as well as the unique spectrum environment at 470-512 MHz band where land mobile and broadcast television stations both operate.
3. I performed the foregoing analysis of interference to land mobile systems. The analysis is true and accurate to the best of my knowledge. Further, I have reviewed the description of this analysis in the attached pleading and the corresponding statements made therein are true and accurate to the best of my knowledge.

Signed:

David Eierman

Dated:

Sept 11, 1998

### TV to Land Mobile Interference Level Calculations

The performance of Land Mobile receivers in the 470 MHz to 512 MHz band is referenced relative to the receiver's 12 dB SINAD static sensitivity. Static sensitivity is a function of the receiver's Effective Noise Bandwidth (ENBW), Noise Figure, and static Carrier to Noise ratio (C/N). The typical 12 dB SINAD static sensitivity for fixed station receivers in this band is 0.35  $\mu$ V or -116 dBm into 50 ohm impedance. The ENBW is typically in the range of 10 to 15 kHz for analog equipment used on 25 kHz spaced channels. C/N is about 4 dB for 12 dB SINAD. Therefore, the receiver's internal noise floor is about -120 dBm for a typical LMR receiver. (Note that the 1964 Carey report probably used 50 kHz equipment and receiver sensitivities of 0.5 mV (-113 dBm) to come up with UHF 90 percent reliability factor of 39 dBu.)

Operation in the presence of Rayleigh multipath propagation requires a stronger signal to overcome the rapid fading of the signal. For speech understandable with only slight effort and occasional repetitions, a faded Carrier to Noise Ratio (C/N) of 17 dB is required [See TIA/EIA TSB-88]. This is a signal level of about -103 dBm [typical -120 dBm internal noise floor plus 17 dB C/N]. This is the minimal receiver input signal level most existing LMR systems are designed around. Another 10 dB provides the 90% reliability used as the coverage design criteria for many LMR systems. Some users require even greater



reliability.

Considering the expected migration to more narrowband equipment, the ENBW of analog equipment used on 12.5 kHz spaced channels will be in the range of 7.5 to 10 kHz. Cs/N will be about 7 dB and Cf/N will be about 23 dB. A 12 dB SINAD static sensitivity will remain at 0.35  $\mu$ V. Therefore, internal noise is lower at -123 dBm in the narrower measurement bandwidth. But, faded signal level used to define LMR system coverage is higher at -100 dBm in the narrower channel bandwidth.

Both Cs/N and Cf/N are relative to the receiver's internal noise floor. Any external interference getting into the receiver's effective bandwidth can be treated as a noise source and combined with the receiver's internal noise level in that same bandwidth. Therefore, any unwanted signal reaching the receiver that increases the noise floor will degrade the receiver's static and faded sensitivity, which in turn reduces coverage range. An interference signal reaching the receiver at the same level as the receiver's internal noise floor will degrade performance by 3 dB and would reduce coverage range by about 10%.

**Summary Table**

	<b>Typical 12 dB SINAD Static Sensitivity Level</b>	<b>Cs/N</b>	<b>Internal Noise Level</b>	<b>Cf/N</b>	<b>Faded Sensitivity</b>	<b>90 % Reliability (add 10 dB)</b>
Analog FM, 5 kHz deviation, 25 kHz spaced channels, 10-15 kHz ENBW	-116 dBm	4 dB	-120 dBm	17 dB	-103 dBm	-93 dBm
Analog FM, 2.5 kHz deviation, 12.5 kHz spaced channels, 7.5-10 kHz ENBW	-116 dBm	7 dB	-123 dBm	23 dB	-100 dBm	-90 dBm

The level of out-of-band interference from the adjacent NTSC TV channel 19 reaching the LMR channel 18 receivers (@ 497-500 MHz) must be estimated and combined with the receiver's internal noise floor to determine the effects on LMR system performance.

## Calculations:

Working Backwards from the land mobile radio noise floor to NTSC spurious emission level:

	<u>25 kHz systems</u>	<u>12.5 kHz systems</u>
LMR Rcvr Noise Goal for less than 3 dB degradation	-120 dBm	-123 dBm
For less than 1 dB degradation	- 6 dB	- 6 dB
LMR Rcvr Antenna Network	-(- 3 dB)	-(- 3 dB)
LMR Base Antenna	-(+ 7 dB)	-(+ 7 dB)
	-----	-----
Maximum Field Strength @ LMR Rcvr Site on 499.9875 MHz	-130 dBm	-133 dBm
LMR to Broadcast Antenna Polarization Adjustment	-(- 20 dB)	-(- 20 dB)
Free Space Propagation Loss to point where Ch 19 64 dBm contour abuts LM 50 mile radius (about 50 miles)	-(-120 dB)	-(-120 dB)
	-----	-----
Maximum Ch 19 out-of-band emission level at 499.9875 MHz @ LMR measurement bandwidth	+ 10 dBm (15 kHz ENBW)	+ 7 dBm (7.5 kHz ENBW)
Convert to 30 kHz TV measurement bandwidth to LMR measurement bandwidth	-(- 3 dB)	-(- 6 dB)
	-----	-----
Maximum Ch 19 out-of-band emission level at 499.9875 MHz @ 30 kHz measurement bandwidth	+ 13 dBm	+ 13 dBm

Thus, for 1 Megawatt NTSC Channel 19 transmitter (+90 dBm), approximately 75-80 dB of attenuation would be required at 499.9875 kHz to protect typical LMR base station receiver located about 50 miles away.

## Assumptions:

- NTSC spurious emissions are noise-like and Broadcast power is measured in a 30 kHz bandwidth (30 kHz used in 73.687(e)(4)(ii) for Channel 14 to LMR interference). Amount of power intercepted by a 15 kHz ENBW LMR receiver relative to broadcast power level measured in 30 kHz bandwidth =  $10 \times \log(15/30) = -3 \text{ dB}$  (-6 dB for 7.5 kHz ENBW equipment).

- Attenuation of horizontally polarized NTSC signal into vertically polarized LMR antenna is 20 dB.
- LMR antenna gain is 7 dB relative to a half-wave dipole and transmission line and filtering losses are 3 dB.
- TV Channel ERP is referenced relative to a half-wave dipole antenna.
- LMR receiver sensitivity is -116 dBm.
- Cs/N for 25 kHz LMR equipment is 4 dB and for 12.5 kHz equipment is 7 dB.
- Acceptable TV to LMR degradation is less than 1 dB.
- LMR base stations are located at tower sites or mountain-top sites with HAAT greater than 500 feet and only Free Space Loss exists between the sites.

## CERTIFICATE OF SERVICE

I, Jane Nauman, hereby certify that copies of the foregoing "Motion for Leave to File Response" and "Response of APCO to Consolidated Reply to Oppositions" were filed this 14<sup>th</sup> day of September, 1998, to the following individuals at the addresses listed below:

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